ſure me, this lad has a ſiſter about ten years of age in the ſame declining ſtate. I am,

Dear Sir,

Yours moſt affectionately,

John Browning.

As new-born children frequently exceed in weight this youth of fifteen years, I take the liberty to communicate his caſe, believing it will not be thought incurious.

H. Baker.

XLIII. *A Letter from Mr.* Rich. Dunthorne *to the Rev. Dr.* Long, *F. R. S. Maſter of* Pembroke-Hall *in* Cambridge, *and* Lowndes's *Profeſſor of Aſtronomy and Geometry in that Univerſity, concerning* Comets.

SIR, Cambridge Oct. 5, 1751.

Read Nov. 14, 1751.

THERE is a manuſcript in your college library, chiefly aſtrological, wherein there are five tracts of different authors concerning comets. One of them, intituled, *Tractatus fratris Egidii de cometis* (written on account of a comet, which appeared in the year of our Lord 1264) contains theſe paſſages relating to its place and motion:

Prolog. " Stella caudata ſeu crinita apparuit in
" regno Franciæ in oriente ante ſolis ortum a 19° kalendas
" Auguſti uſque 5° nonas Octobris in anno
" Domini 1264.

Cap. 1. " Cometem, cujus occaſione hæc ſcripſimus,
" primo vidimus extra circulum zodiaci verſus
" aquilonem contra cancrum, et demum eundem
" vidimus extra circulum verſus auſtrum ſub geminis
" inter canem et orionem.

Cap. 3. " Vidimus autem et ſtellam caudatam,
" cujus occaſione hoc ſcripſimus, præter motum circularem
" diurnum, æque moveri motu retrogradationis,
" et nulli alii ſimilis, ſecundum latitudinem
" ejus, quæ eſt a ſeptentrione ad auſtrum. Viſus eſt
" moveri per duos menſes ſolares pluſquam 40 gradus,
" vix per 3 gradus longitudinis permutans ſitum.

Cap. 7. " Cometes, cujus occaſione hæc ſcripſimus,
" primo viſa eſt in veſpere poſt ſolis occaſum,
" demum poſt paucos dies ſolem pertranſiens in
" mane circa octavum gradum cancri, et ex hinc
" cito proceſſit retro in geminos: ——— vidimus
" autem et cometem moveri ab aquilone ad auſtrum,
" ſecundum latitudinem quidem plus 50 graduum, et
" ſecundum longitudem quidem vix 5 gradus proceſſiſſe."

Hevelius in his *Cometographia* has alſo given us the following paragraph, among others, concerning this comet:

" A. C. 1264, ſtella, quæ dicitur cometes, apparuit,
" videlicet in oriente, ante ortum diei, poſt ſtellam
" matutinam: apparuit, ſcilicet, ante auroram
" cum radiis multis: ipſi ejus radii longe lateque

" apparuerunt antequam oriretur ipſa ſtella cometes.
" Igitur veloci curſu laboravit ipſa ſtella cometes, ita
" quod præcurrerit & longe verſus meridiem præceſſit
" ſtellam matutinam, i. e. luciferum. Viſa eſt circa
" feſtum S. Mariæ Magdalenæ, & uſque ad octavam
" S. Auguſtini apparuit. *Compilat. Chronol.*"

Although this whole account be very ſlender and rude, it is however much the beſt I have met withal of any comet earlier than that, which was obſerved by Regiomontanus in the year 1472 (except perhaps the account given us by Nicephorus Gregoras of the comet of the year 1337, whoſe orbit is computed by Dr. Halley): for which reaſon, I was induced to try, whether I could inveſtigate a ſet of elements capable of repreſenting the places of this comet agreeable to the above deſcription, and after ſeveral attempts, ſome of them indeed but tentative, I fixed upon the following numbers for that purpoſe, *viz.* the place of its aſcending node in ♍ 19°, the inclination of its orbit to the plane of the ecliptic 36°$\frac{1}{2}$, the place of its perihelion in ♑ 21°, its perihelion diſtance from the ſun 44500 ſuch parts as the mean diſtance of the earth from the ſun contains 100000, and the time of its being in perihelion July 6^{d} 8^{h} *p. m.* The motion of the comet in this orbit was direct.

Its places computed from theſe elements are as in the following table.

Time

Time.			Comet's long.			Comet's latit.			
						°			
July	1	in the evening	♋	25	57	22	13	North	Here it might be ſeen in the evening after ſunſet *.
	†								
	14	in the morning	♋	7	58	10	49		Here, in the ſouthern parts of Europe, it aroſe *ante ortum diei poſt ſtellam matutinam.*
	18		♋	4	8	5	2		
	22		♋	1	40	0	30	South	
	26		♋	0	16	5	31		
	30		♊	29	35	9	59		
Aug.	3		♊	29	21	13	58		
	7		♊	29	23	17	30		
	11		♊	29	34	20	42		
	15		♊	29	49	23	39		
	19		♋	0	2	26	23		
	23		♋	0	12	28	58		
	27		♋	0	17	31	24		
	31		♋	0	16	33	42		
Sept.	4		♋	0	1	35	56		
	8		♊	29	36	38	4		Here it was *inter canem et orionem.*
	12		♊	29	0	40	6		
	16		♊	28	12	42	4		
	20		♊	27	7	43	55		
	24		♊	25	46	45	41		
	28		♊	24	8	47	18		
Oct.	3		♊	21	44	49	8		

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* Perhaps the tail might not be conſpicuous enough to occaſion its being taken much notice of, in its deſcent towards the perihelion.

† July the 6, the comet was in the ſame right aſcenſion with the ſun, and had near 41°½ north declination; ſo that in the ſouth of France it ſet about the going down of twilight, and did not riſe again till day-break; and therefore might eſcape being ſeen for a few days, either morning or evening, about this time.

I think

I think the computed places here ſet down agree as well with the foregoing deſcription as any regular *computus* can be expected to do; and the reſemblance of all the elements gives ſome ground for conjecture, that this comet might poſſibly be the ſame with that which was obſerv'd by Paul Fabritius and others in the year 1556, whoſe orbit Dr. Halley has computed: See his *Synopſis Aſtronomiæ cometicæ.* Indeed the change in the place of the perihelion may perhaps be thought greater than could ariſe from the mutual gravitations of the comets diſturbing one another; but then it may be conſider'd, that neither the place nor time of the perihelion, nor the perihelion diſtance of the comet of the year 1556, could be determined very accurately from obſervations made only for 12 days, at 40 days diſtance from the perihelion, as thoſe of Fabritius were, unleſs they had been more exact than his appear to be. If theſe were one and the ſame comet, its period is 292 years; and we may expect its return about the year 1848.

There are in the before-mention'd manuſcript, beſides the paſſages already quoted from Egidius, two other places which deſerve to be taken notice of. One of them is ſo much of a ſmall tract, intituled, *Judicium de ſtella comata anno Domini* 1301, as concerns the place and motion of the comet; it is as follows:

"A. D. MCCC primo, primo die Septembris apparuit cometa in occidente, et per menſem vel amplius viſus fuit. —— Ultima autem die Septembris duabus horis 40 minutis poſt occaſum ſolis — inveni quod longitudo cometæ in ſignis et gradibus erat

“ erat 20 gradus ſcorpionis, et latitudo * 26 gradus
“ ſeptentrionalis: Mars autem tunc erat in 20 gradu
“ ſcorpionis directus exeuns, et ſic fere conjuncti
“ erant Mars et cometa accipiendo loca ipſorum per
“ circulum tranſeuntem per polos zodiaci. — Verum
“ et ſexta die Octobris, ſcilicet in feſto Sanctæ Fidis
“ poſt occaſum ſolis eadem hora inveni quod longi-
“ tudo ejus erat primus gradus ſagittarii, et latitudo
“ ejus 10 gradus ſeptentrionalis. — Cometæ latitudo
“ ecliptica circa principium apparitionis ſuæ fuit 20
“ gradus et amplius ſeptentrionalis. — Apparebat co-
“ meta moveri a ſeptentrione in meridiem per oriens,
“ ita quod ejus longitudo orientalis continue videba-
“ tur augeri, et ejus latitudo ſeptentrionalis continue
“ videbatur diminui. — In principio apparitionis ſuæ
“ coma protendebatur ad ſeptentrionem; et poſt mo-
“ tum ſucceſſive movebatur per orientem ad meridiem
“ verſus ſtellam quæ dicitur *altayr* hoc eſt vultur
“ volans.”

Though this account is too imperfect for us to attempt determining the orbit therefrom, it may notwithſtanding help us to know the ſame comet again, if any ſhould hereafter appear whoſe orbit will agree with this relation; which I believe none of thoſe already computed will do.

The other place I hinted at as worthy of notice, is this ſhort paſſage in a treatiſe *De ſignificatione cometarum:*

“ Et

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* This figure (2) is a different writing from the reſt of the manuſcript, and has manifeſtly been alter’d ſince it was firſt written; it ſeems to have been 16° at the firſt, which I think the truer reading.

“ Et nos invenimus modo quod apparuit in tempore
“ noſtro unus cometa in principio piſcium, et cauda
“ attingit uſque ad principium geminorum in nocte
“ Mercurii, et hoc fuit in ultimam nocte Junii, anno
“ 499 Arab. et ſequebatur ordinem ſignorum quo-
“ uſque venit uſque ad principium cancri, et dimiſit
“ ordinem ſignorum, et incepit deficere.”

The word Junii here found ſeems to have been tranſcribed by miſtake for the Arabic month Jumedi.j, the laſt day whereof that year was Wedneſday Feb. 7. A. C. 1106; whereas the laſt day of June fell upon Saturday. This reading agrees with the following notes concerning the ſame comet collected by Hevelius in his *Cometographia*, p. 821.

“ A. C. 1106 a prima hebdomada quadrageſimæ
“ cometam immenſi fulgoris uſque ad paſſionem Do-
“ mini conſpeximus.” *Lavath ex Urſpurg.*

“ A. C. 1106, menſe Februar. biduo poſt novi-
“ lunium, viſus eſt magnus cometa, ad occaſum ſo-
“ lis brumalem.” *Calviſ. ex Tyr.*

The new moon was Feb. 5, Aſh-Wedneſday that year Feb. 7, and Good-Friday, March 23.

If we ſuppoſe (with Dr. Halley) this comet to be the ſame with that which appeared in 1680, and that it was *in perihelio* Feb. 4, at noon (for it muſt have been ſeen in two or three days after it had paſſed its perihelion) ſome of its places would have been theſe:

Feb.

	d	h	Com. Long. ° ′	Com. Lat. ° ′
Feb.	7	6	♓ 7 50	5 44 North
Mar.	14	7½	♉ 11 49	
	19	8	♉ 15 38	
	24	8	♉ 19 2	

The wide diſagreement there is between the manuſcript account of this comet, and its places here computed, muſt very much leſſen, if it does not quite overbalance, the force of the arguments brought by Dr. Halley to prove the identity of theſe two comets.

Indeed if this comet had been the ſame with that of 1680, it could not have come to the beginning of Cancer, without a change in the place of the perihelion too great to be eaſily admitted; nor could it have left the order of the ſigns without a change in the elements ſtill greater. I am,

S I R,

Your obliged, and

moſt obedient ſervant,

Richard Dunthorne.

XLIV.